Agenda

- The purpose of the tiger team is to map science objectives into detailed orbital requirements. These orbital requirements can then be used to test various orbits within the range of possibility (5-10 degrees inclination, 5.3 to 5.8 Re apogee, 600 km perigee) to see which orbits make the most sense for RBSP. The tiger team will provide recommendations, and detailed analysis with objective criteria in order to support these recommendations.

- The final decision will be made at the project level, taking into account the tiger team discussions, and discussions during the in-person SWG meeting, which has now been set for the week of 25 June (detailed agenda and dates to follow in another email).

- We have a very limited time to do these analyses and write up these recommendations, so time commitment will be critical from all team members. This task should be finished by the in-person SWG meeting at the end of June.

- Here is the agenda for today's WEBEX session:

- 1. Brief discussion of tiger team purpose and task (Rowland)
- 2. Possible approach - fleshing out the science flowdown document to the extent necessary to define the mapping from objectives to orbital requirements
- discussion of document structure (Objectives -> Approaches -> Methods -> Specific Observables -> Instruments, Spacecraft, and Orbit) (Giles)
- list of specific observables, and the SO's that drive the orbit discussion
- correspondence of Paul O'Brien's submission to this effort
- 3. Discussion of possible orbits to be used for tests
- 4. Discussion of test parameters that can be extracted from APL orbit simulations which map orbits into realistic magnetic field models (Takahashi)
- 5. General discussion and strategy
- 6. Homework assignments: flesh out SO's; finalize orbit list; finalize list of test parameters that will be matched against requirements; document orbit requirements contained in SO's
- 7. Set date and time for next meeting. At the next meeting we will discuss the fleshed out SO's, and decide on a final list of candidate orbits and test parameters. We will also ask teams to provide written / powerpoint backup for their choices of L ranges, MLT ranges, latitude ranges, etc for each of the orbit tests.

Possible Specific Observables that drive requirements

SO1: Radial profiles of phase space densities (PSD) -> informs apogee, lapping rate

SO4: Local, Detailed Relativistic (electrons) and/or near-relativistic (ion) distributions -> informs inclination, lapping rate

-- includes shape of distribution

-- includes magnetic field requirement

SO6: Mid-energy non-relativistic particle distributions -> apogee, lapping rate

-- ring current

-- midnight sources

SO14: Wave statistical survey (LT, L) -> informs inclination , LT at launch, mission length

-- Chorus and Magnetosonic

-- EMIC

-- HISS

Others?

Strawman orbits

- LV can guarantee 0.2 Re of separation; it is likely that the LV could achieve 0.3 Re.
- Perigee for this discussion is fixed at 630 km
- Inclination for this discussion must lie between 5 (TBR, set by LV) and 10 (current baseline)
- Orbit apogees must lie between 5.3 and 5.8 Re
- List of strawman orbits for testing:
- orbit files will be posted to wiki

orbit	perigee (km alt)	apogee (Re geocentric)	inclination
1	630	5.8	11
2	630	5.8	6
3	630	5.8 - 140 km	11
4	630	5.7	11
5	630	5.7 - 140 km	11
6	630	5.6	11
7	630	5.6 - 140 km	11
8	630	5.5	11
9	630	5.5	6
10	630	5.5 - 140 km	11
11	630	5.4	11
12	630	5.4 - 140 km	11
13	630	5.3	11
14	630	5.3	6
15	630	5.3 - 140 km	11

- Define orbit test parameters that can be applied to orbits to determine how well they match the science objectives.

- These parameters should be possible to derive, using APL orbit software and (realistic) magnetic field mapping software.

- e.g.

  - radial distance at which RBSP field line crosses magnetic equator

  - MLT

  - ratio of local magnetic field strength to equatorial field strength

  - magnetic latitude

Homework

- flesh out prioritized SO's including changes to SO list
- justify with plots, discussion, literature choices for L range, MLT range, etc.
- finalize list of orbits
- flesh out list of test parameters